ORDER NO. HAD84072864C2

Service Manual

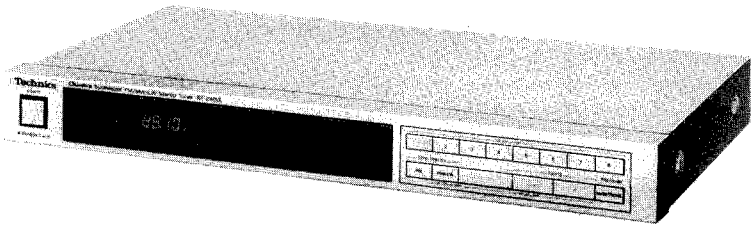
Tuner

QUARTZ Synthesizer FM/MW/LW Stereo Tuner

ST-Z400L

Color

(K)...Black Type
(S)...Silver Type



Color	Area
(K)(S)	[EX]...Scandinavia and Switzerland.
(K)(S)	[EK]...United Kingdom
(S)	[EF]...France
(K)(S)	[EB]...Belgium

SPECIFICATION
(DIN 45 500)

■ FM TUNER SECTION

Frequency range	87.50~108.00 MHz
Sensitivity	
S/N 30 dB	1.0 μV (75Ω)
S/N 26 dB	0.9 μV (75Ω)
S/N 20 dB	0.8 μV (75Ω)
IHF usable sensitivity	0.95 μV (IHF '58)
IHF 46 dB stereo quieting sensitivity	22 μV/75Ω
Total harmonic distortion	
MONO	0.15%
STEREO	0.3%
S/N	
MONO	69 dB (75 dB, IHF)
STEREO	64 dB (70 dB, IHF)
Frequency response	5 Hz~18 kHz, +0.5 dB~ −1.5 dB
Alternate channel selectivity	
normal ±400 kHz	60 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	55 dB
IF rejection at 98 MHz	90 dB
Spurious response rejection at 98 MHz	80 dB
AM suppression	55 dB
Stereo separation	
1 kHz	45 dB
10 kHz	30 dB
Carrier leak	
19 kHz	−40 dB (−45 dB, IHF)
38 kHz	−40 dB (−45 dB, IHF)
Channel balance (250 Hz~6,300 Hz)	±1 dB
Limiting point	1.0 μV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminals	
For United Kingdom	75Ω(unbalanced), 300Ω(balanced)
For others	75Ω (unbalanced)

■ AM TUNER SECTION

Frequency range	
MW	522~1611 kHz
LW	155~353 kHz
	153~351 kHz (−2 kHz shift)
Sensitivity (S/N 20 dB)	
MW at 999 kHz	20 μV, 300 μV/m
LW at 254 kHz	100 μV
Selectivity (±9 kHz)	
MW at 999 kHz	55 dB
LW at 254 kHz	55 dB
Image rejection	
MW at 999 kHz	40 dB
LW at 254 kHz	40 dB
IF rejection	
MW at 999 kHz	60 dB
LW at 254 kHz	50 dB

■ GENERAL

Output voltage	0.4V
Power consumption	9W
Power supply	
For United Kingdom	AC 50 Hz/60 Hz, 240V
For continental Europe	AC 50 Hz/60 Hz, 220V
Dimensions (W×H×D)	430 × 53 × 240 mm
	(16-15/16" × 2-3/32" × 9-7/16")
Weight	2.1 kg, (4.6 lb.)

(Specifications are subject to change without notice for further improvement.)

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

ST-Z400L

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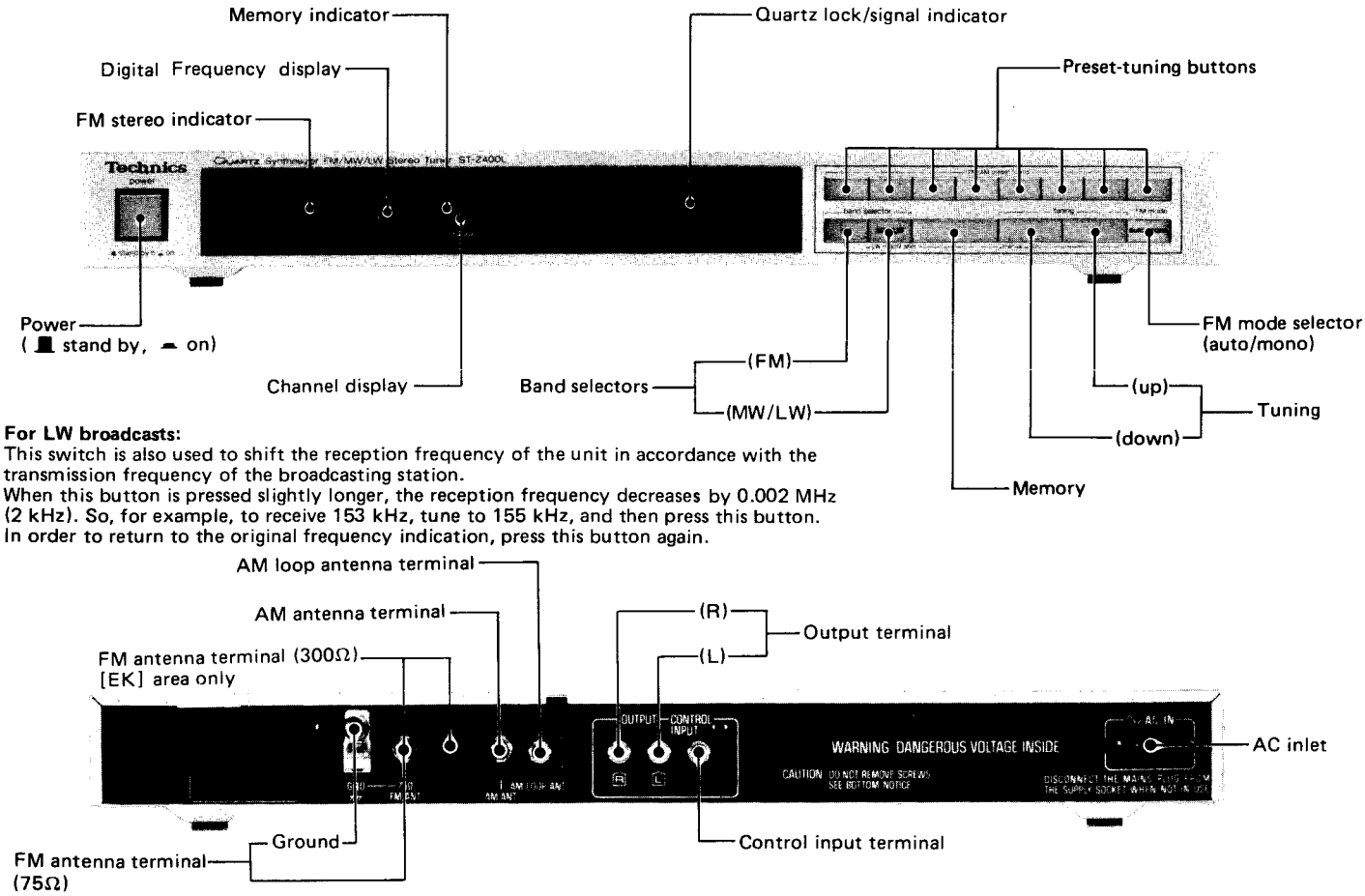
■ LOCATION OF CONTROLS



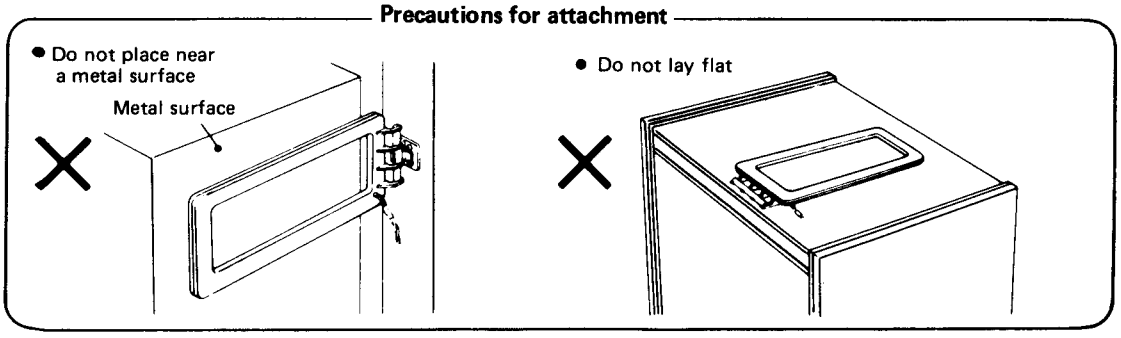
For LW broadcasts:
This switch is also used to shift the reception frequency of the unit in accordance with the transmission frequency of the broadcasting station.
When this button is pressed slightly longer, the reception frequency decreases by 0.002 MHz (2 kHz). So, for example, to receive 153 kHz, tune to 155 kHz, and then press this button.
In order to return to the original frequency indication, press this button again.

- The power supply for this unit varied depending upon the areas. Also, the parts used for power supply are different. So, refer to the circuit diagram and the replacement parts list;
  - ★ 220V (50/60 Hz) for Continental Europe.
  - ★ 240V (50/60 Hz) for United Kingdom.

■ AM LOOP ANTENNA

When the AM loop antenna is connected to the rear panel, place it as far away from the set as possible to improve the sensitivity.

Precautions for attachment



ORDER NO. HAD84072864C2-A

DEUTSCH

QUARTZ Synthesizer
FM/MW/LW Stereo Tuner

ST-Z400L

- This booklet includes the specifications and adjustment of Model ST-Z400L (Order No. HAD84072864C2) written in German and French.
- File this booklet together with the service manual of Model ST-Z400L.

- Dieses Büchlein umfaßt die technischen Daten und Justierungsanleitungen von Modell ST-Z400L (Bestell Nr. HAD84072864C2) in den Sprachen Deutsch und Französisch.
- Bewahren Sie dieses Büchlein zusammen mit dem Service-Handbuch von Modell ST-Z400L auf.

- Cette brochure comprend les spécifications et la mise au point du Modèle ST-Z400L (N° d'Ordre HAD84072864C2) écrites en allenmand et en francais.
- Classer cette brochure en meme temps qu'avec le manuel de service du Modele ST-Z400L.

DEUTSCH

■ TECHNISCHE DATEN

(DIN 45 500)

■ UKW-TUNERTEIL

Wellenbereich	87,50 ~ 108,00 MHz
Eingangsempfindlichkeit	
S/R 30 dB	1,0 μV (75 Ω)
S/R 26 dB	0,9 μV (75 Ω)
S/R 20 dB	0,8 μV (75 Ω)
Nutzempfindlichkeit nach IHF	0,95 μV (nach IHF '58)
Stereoumschaltschwelle bei 46 dB nach IHF	22 μV/75 Ω
Gesamtklirrfaktor	
Mono	0,15%
Stereo	0,3%
Geräuschabstand	
Mono	69 dB (75 dB nach IHF)
Stereo	64 dB (70 dB nach IHF)
Frequenzgang	5 Hz ~ 18 kHz (+0,5 dB ~ −1,5 dB)
Trennschärfe bei Störsender	
normal ±400 kHz	60 dB
Einfangverhältnis	1,0 dB
Spiegelfrequenz-Dämpfung bei 98 MHz	55 dB
ZF-Dämpfung bei 98 MHz	90 dB
Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	80 dB
MW-Unterdrückung	55 dB
Übersprechdämpfung	
1 kHz	45 dB
10 kHz	30 dB
Trägerrest	
19 kHz	−40 dB (−45 dB nach IHF)
38 kHz	−40 dB (−45 dB nach IHF)
Kanalabweichung (250 Hz ~ 6300 Hz)	±1 dB
Begrenzereinsatz	1,0 μV
Bandbreite	
ZF-Verstärker	180 kHz
UKW-Demodulator	1000 kHz
Antennenanschluß	75 Ω (unsymmetrisch)

■ MW-TUNERTEIL

Wellenbereiche	
MW	522 ~ 1611 kHz
LW	155 ~ 353 kHz
	153~351 kHz (−2 kHz shift)
Eingangsempfindlichkeit (S/R 20 dB)	
MW bei 999 kHz	20 μV, 300 μV/m
LW bei 254 kHz	100 μV
Trennschärfe (±9 kHz)	
MW bei 999 kHz	55 dB
LW bei 254 kHz	55 dB
Spiegelfrequenz-Dämpfung	
MW bei 999 kHz	40 dB
LW bei 254 kHz	40 dB
ZF-Dämpfung	
MW bei 999 kHz	60 dB
LW bei 254 kHz	50 dB

■ ALLGEMEINE DATEN

Ausgangsspannung	0,4 V
Leistungsaufnahme	9W
Netzspannung	
Für Kontinentaleuropa	Wechselstrom 50 Hz/60 Hz, 220V
Abmessungen (B×H×T)	430 × 53 × 240 mm
Gewicht	2,1 kg

(Die technischen Daten können infolge von Verbesserungen ohne Ankündigung geändert werden.)

■ MESSUNGEN UND JUSTIERUNGEN

Anmerkung: Die AM-OSC-Spule (L203), AM ZFT (T201) und LW ant. Spule (L251) sind bereits justiert und benötigen daher keine Justierung.

AM (MW)-EINSTELLUNG

*** Einstellungen und zu benutzende Geräte**

1. Elektronisches Voltmeter für Wechsel- und Gleichstrom (EVM).
2. AM (MW)-Meßsender (AM-SG).
3. FM/AM-Wahlschalter in die "MW/LW"-Position stellen. (9 kHz-Schritt)
4. Netzspannung auf ihrem Sollwert halten.
5. Der Ausgang des Meßsenders darf nicht höher sein als unbedingt notwendig für eine gute Ablesung.
6. Einen nichtmetallischen Schraubenzieher für die Einstellungen verwenden.

	AM (MW)-MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHS-PUNKTE	ABGLEICHSVERFAHREN
	ANSCHLUSS	FREQUENZ				
	AM (MW)-HF-ABGLEICH *Bandwahlschalter in die "MW"-Position stellen.					
1	AM-MO über 200 pF-Kondensator an den AM-Antennenanschluß anschließen. Erdung an chassis. (Schwacher Eingang.)	612 kHz (400 Hz Modulat., 30%)	612 kHz	Wechselstrom-Voltmeter oder Oszillograph über den Ausgang "OUTPUT" anschließen.	L202 (Ant. Spule)	1. Auf max. Ausgang abgleichen. 2. Den Kern von L202 mit einem Schraubendreher justieren.
2		1503 kHz (400 Hz Modulat., 30%)	1503 kHz		CT201 (Ant. Trimmer)	1. Auf max. Ausgang abgleichen. 2. Die Schritte (1) und (2) wiederholen, bis die Frequenz genau mit der Skalenanzeige übereinstimmt.
	LW-HF-ABGLEICH *Bandwahlschalter in die "LW"-Position stellen.					
3	AM-MO über 200 pF-Kondensator an den AM-Antennenanschluß anschließen. (Schwacher Eingang.)	155 kHz (400Hz Modulat., 30%)	155 kHz	Wechselstrom-Voltmeter oder Oszillograph über den Ausgang "OUTPUT" anschließen.	L252 (Osz.-Spule)	1. Auf max. Ausgang abgleichen. 2. Den Kern von L252 mit einem Schraubendreher justieren.
4		353 kHz (400 Hz Modulat., 30%	353 kHz		CT251 (LW Ant.-Trimmer)	1. Auf max. Ausgang abgleichen. 2. Die Schritte (3) und (4) wiederholen, bis die Frequenz genau mit der Skalenanzeige übereinstimmt.

FM (UKW)-EINSTELLUNG

*** Einstellungen und zu benutzende Geräte**

1. UKW-Meßsender (FM-SG)
2. Stereo-Modulator
3. Oszillograph
4. Elektronische Voltmeter für Wechsel- und Gleichstrom (EVM).
5. Signalfrequenzmesser (meßbar für 19 kHz und 108 MHz).
6. Tiefpaßfilter (fc = 15 kHz ~ 19 kHz).
7. FM/AM-Wahlschalter in die "FM"-Position stellen.
8. Den UKW-Betriebsartenschalter in die "mono"-Position stellen.

*** Vorbereitung am UKW-Messender (FM-SG)**

1. SG-Ausgang über 75-Ohm-UKW-Kunstantenne an den Antenneneingang des Gerätes anschließen.
2. Der normale Eingang des Gerätes beträt 60 dB (1 mV), 400 Hz, 100% Modulation. Wegen Verwendung der Kunstantenne muß ber Signalausgang 12 dB (4μV) plus (ZHF) sein: d.h. beim Eingang von 60 dB (1 mV) soll der Signalausgang 72 dB 4 mV) sein.)

	FM (UKW)-MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHS-PUNKTE	ABGLEICHSVERFAHREN
	ANSCHLUSS	FREQUENZ				
	UKW-ZF-ABGLEICH					
5	Meßsender über eine 75Ω-UKW-Kunstantenne an den UKW-Antennen-eingang anschließen. (60 dB (1 mV) in den Antenneneingang leiten.)	100,1 MHz (400 Hz Modulat., 100%)	100,1 MHz	Ein Gleichstrom-Voltmeter (EVM) an TP101 (–) und TP102 (+) über eine Drosselspule verbinden. (Siehe Abb. 1)	T101 (Diskriminator ZFT)	Den Kern von T101 so justieren, daß die gemessene Spannung im signallosen Zustand 0 mV im 300 mV Bereich beträgt.

UKW-STEREO-DEKODER-ABGLEICH

	UNTER VERWENDUNG EINES ZÄHLERS	ALTERNATIVE MESSMETHODE
6	1. Unmoduliertes Mono-Signal 100,1 MHz in das Gerät speisen. 2. UKW-Betriebsart-Schalter auf "auto" stellen. 3. Zähler über einen Widerstand von 100kOhm an TP301 anschließen. (Vgl. Abb. 2) 4. **VR301** auf 19 kHz ± 30 Hz einstellen.	1. Stereosignal entweder von einem Meßsender, oder einem Stereosender in den Tuner speisen. 2. **VR301** so einstellen, daß die Stereolampe aufleuchtet. Schleifer von **VR301** sichern, wie in Abb. 3 gezeigt.

	FM (UKW)-MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHS-PUNKTE	ABGLEICHSVERFAHREN
	ANSCHLUSS	FREQUENZ				
	TERNNUNGS-ABGLEICH					
7	Meßsender über eine UKW-Kunstantenne an den UKW-Antenneneingang anschließen. (Stereo-Pilotsignal 10% moduliert.)	100,1 MHz (400 Hz Modulat., 100%) L oder R-Betriebsart.)	100,1 MHz	Wechselstrom-Voltmeter über Tiefpaßfilter (fc = 15 ~ 19 kHz) an Ausgangsanschlüsse (OUTPUT) des Gerätes schließen.	VR302	1. Den UKW-Betriebsarten-schalter in die "auto"-Position stellen. 2. VR302 auf minimale Anzeige des R-Ausgangs bei Stereo-modulator in L-(L-Kanalmodulation) Modus, und auf minimale Anzeige des L-Ausgangs in R-Modus abgleichen.

FRANÇAIS

■ CARACTERISTIQUES

(DIN 45 500)

■ SECTION SYNTONISATEUR FM

Gamme de fréquence	87,50~108,00 MHz
Sensibilité	
S/B 30 dB	1,0 μV (75Ω)
S/B 26 dB	0,9 μV (75Ω)
S/B 20 dB	0,8 μV (75Ω)
Sensibilité utilisable IHF	0,95 μV (IHF '58)
Sensibilité stéréo au seuil de 46 dB, IHF	22 μV/75Ω
Distorsion harmonique totale	
MONO	0,15%
STEREO	0,3%
Signal/Bruit	
MONO	69 dB (75 dB, IHF)
STEREO	64 dB (70 dB, IHF)
Réponse de fréquence	5 Hz~18 kHz, +0,5 dB~ −1,5 dB
Sélectivité alternée par canal	
normal ±400 kHz	60 dB
Taux de capture	1,0 dB
Rejection d'image à 98 MHz	55 dB
Rejection FI à 98 MHz	90 dB
Rejection de réponse parasite à 98 MHz	80 dB
Suppression AM	55 dB
Séparation stéréophonique	
1 kHz	45 dB
10 kHz	30 dB
Fuite de porteuse	
19 kHz	−40 dB (−45 dB, IHF)
38 kHz	−40 dB (−45 dB, IHF)
Equilibrage de canaux (250 Hz~6,300 Hz)	±1 dB
Point de limite	1,0 μV
Largeur de bande	
Amplificateur FI	180 kHz
Démodulateur FM	1000 kHz
Bornes d'antenne	75Ω (asymétrique)

■ SECTION SYNTONISATEUR AM

Gamme de fréquence	
PO (MW)	522~1611 kHz
GO (LW)	155~353 kHz 153~351 kHz (−2 kHz shift)
Sensibilité (S/B 20 dB)	
PO (MW) à 999 kHz	20 μV, 300 μV/m
GO (LW) à 254 kHz	100 μV
Sélectivité (±9 kHz)	
PO (MW) à 999 kHz	55 dB
GO (LW) à 254 kHz	55 dB
Réjection d'image	
PO (MW) à 999 kHz	40 dB
GO (LW) à 254 kHz	40 dB
Réjection FI	
PO (MW) à 999 kHz	60 dB
GO (LW) à 254 kHz	50 dB

■ DIVERS

Tension de sortie	0,4 V
Consommation	9W
Alimentation	
Pour l'Europe	CA 50 Hz/60 Hz, 220V
Dimensions (L×H×Pr)	430 × 53 × 240 mm
Poids	2,1 kg

(Sujet à changement sans avertissement préalable.)

■ MESURAGES ET RÉGLAGES

Nota: La bobine oscillatrice de modulation d'amplitude (L203) et le transformateur de fréquence intermédiaire de modulation d'amplitude (T201) et le bobine ANT LW (L251) ont déjà été ajustés et ne nécessitent pas de réglages.

RÉGLAGE DE MA

* **Réglage et équipement utilisé**

1. Voltmètres électroniques de courant alternatif et de courant continu (EVM).
2. Générateur de signaux MA (AM-SG).
3. Régler le sélecteur FM-MA sur la position "MW/LW". (étape de 9 kHz).
4. Conserver la tension du secteur à la tension nominale.
5. La sortie du signal du générateur ne doit pas être plus élevée quil n'est nécessaire pour obtenir une lecture en sortie.
6. Utiliser un tournevis non-métallique pour le réglage.

N°	GÉNÉRATEUR DE SIGNAUX MA		FRÉQUENCE D'AFFICHAGE	PRÉPARATIFS	ÉLÉMENTS RÉGLÉS	PROCÉDURE DE RÉGLAGE
	BRANCHEMENT	FRÉQUENCE				
	RÉGLAGE DE RF-MW (OM) *Régler le commutateur de gammes d'ondes sur la position "MW".					
1	Brancher le générateur de signaux MA à la borne de l'antenne MA par un condensateur de 200pF. Commun au châssis. (Entrée faible)	612 kHz (Modulé à 30% par 400 Hz)	612 kHz	Voltmètre électronique C.A. ou oscilloscope sur bornes de sortie de l'appareil.	L202 (Bobine d'antenne)	1. Régler au maximum du signal de sortie. 2. Régler le noyau en ferrite de L202 à l'aide d'un tournevis.
2		1503 kHz (Modulé à 30% par 400 Hz)	1503 kHz		CT201 (Trimmer d'antenne)	1. Régler au maximum du signal de sortie. 2. Répéter les étapes (1) et (2) jusqu'à ce que la fréquence s'aligne correctement avec l'affichage de la fréquence.
	RÉGLAGE DE RF-LW (GO) *Régler le commutateur de gammes d'ondes sur la position "LW".					
3	Brancher le générateur de signaux MA àla borne de l'antenne MA per un condensateur de 200pF. Commun au châsis. (Entrée faible)	155 kHz (modulé à 30% par 400 Hz)	155 kHz	Voltmètre électrinique C.A. ou oscilloscope sur bornes de sortie de l'appareil.	L252 (Bobine OSC)	1. Régler au maximum du signal de sortie. 2. Régler le noyau en ferrite de L252 à l'aide d'un tournevis.
4		353 kHz (modulé à 30% par 400 Hz)	353 kHz		CT251 (Trimmer d'antenne)	1. Régler au maximum du signal de sortie. 2. Répérer les étapes (3) et (4) jusqu'à ce que la fréquence s'aligne correctement avec l'affichage de la fréquence.

RÉGLAGE DE FM

*** Réglage et équipement utilisé**

1. Génerateur de signaux FM (FM-SG).
2. Modulateur stéréophonique.
3. Oscilloscope.
4. Voltmètres électroniques de courant alternatif et de courant continue (EVM).
5. Compteur de fréquence (19 kHz et 108 MHz mesurables).
6. Filtre passe-bas (bobine de champ: 15 kHz ~ 19 kHz).
7. Régler le sélecteur FM-MA sur la position "FM".
8. Régler le commutateur de mode sur la position "mono".

*** Préparatifs pour le générateur de signaux FM (FM-SG).**

1. Almenter la sortie du générateur de signaux à la borne de l'antenne de l'appareil, par l'antenne fictive FM de 75Ω.
2. L'entrée standard de l'appareil est de 60 dB (1 mV), 400 Hz, 100% de modulation [à cause de l'utilisation de l'antenne fictive, la sortie du générateur de signaux doit être de plus 12 dB (4μV) (IHF). Ce qui signifie que quand l'entrée est de 60 dB (1 mV), la sortie du générateur de signaux doit être de 72 dB (4mV)].

N°	GÉNÉRATEUR DE SIGNAUX FM		FRÉQUENCE D'AFFICHAGE	PRÉPARATIFS	ÉLÉMENTS RÉGLÉS	PROCÉDURE DE RÉGLAGE
	BRANCHEMENT	FRÉQUENCE				
	RÉGLAGE DE FM-IF (FRÉQUENCES INTERMÉDIAIRE)					
5	Branchez le générateur de signaux à la borne d'antenne FM à travers une antenne fictive FM de 75Ω. (Appliquer 60 dB (1 mV) à la borne d'antenne.)	100,1 MHz (Modulè à 100% par 400 Hz)	100.1 MHz	Brancher le voltmètre électronique à C.C. entre **TP101** (–) et **TP102** (+) à travers une bobine d'arrêt.) (Voir la Fig. 1)	T101 (Transfor. de FI discri.)	Régler le noyau T101 de telle sorte que la tension mesurée dans le mode de signal, soit de 0 mV dans la plage des 300 mV.
	RÉGLAGE DE V.C.O. DE L' (OSCILLATEUR COMMANDÉ PAR VARIATION DE TENSION) MULTIPLEX FM					
	AVEC UN FRÉQUENCEMÈTRE			EN UTILISANT UN SYSTÈME ALTERNATIF		
6	1. Signal mono de 100,1 MHz, 60 dB non modulé appliqué à l'appareil. (Fig. 2) 2. Commutateur de mode FM sur "auto". 3. Branchez le fréquencemètre sur **TP301** par l'intermédiarie d'une résistance (100kΩ). 4. Régler **VR301** sur 19 kHz ± 30 Hz.			1. Appliquer un signal stéréophonique provenant du générateur ou d'une station stéréo au dispositif d'accord. 2. Ajuster **VR301** jusqu'à ce que l'indicateur stéréophonique s'éclaire. Cimenter le bras de **VR301**, comme il est montré à la Fig. 3.		
	RÉGLAGE DE LA SÉPARATION DES CANAUX					
7	Raccorder la générateur de signaux FM à la borne d'antenne FM à travers l'antenne fictive FM de 75Ω. (Signal stéréo pilote à 10% de modulation.)	100,1 MHz (Modulé à 90% par 1 kHz) (Mode gauche ou droite.)	100,1 MHz	Brancher le voltmètre électronique à C.A. aux bornes de sortie de l'appareil par l'intermédiaire d'un filtre passe-bas, (bobine de champ = 15 kHz ~ 19 kHz)	VR302 (Séparation)	1. Régler le commutateur de mode FM sur "auto". 2. Ajuster VR302 de telle sorte que la sortie de droite soit minimisée lorsque le modulateur stéréophonique est sur la gauche (modulation du canal de gauche) et que la sortie de gauche soit minimisée sur la mode de droite.

■ HOW TO PRESET RADIO BROADCAST FREQUENCIES

This unit can be used to preset as many as 16 radio broadcast frequencies: 8 FM and 8 AM (MW/LW). After broadcast frequencies have been preset as described below, any desired station can be quickly and easily selected by simply touching one button.

• Memory presetting

There are two types of memory presetting: automatic and manual. Select whichever is preferred.

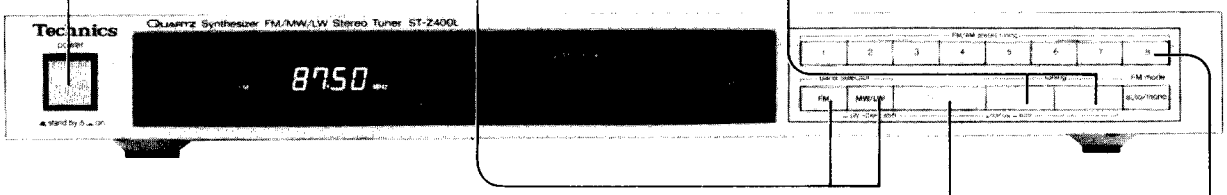
Automatic memory presetting

Beginning at the frequency indicated by the digital display, the FM broadcasting stations, MW broadcasting stations, and LW broadcasting stations will be automatically preset in "channels" 1 through 8 for FM, 1 through 4 for MW, and 5 through 8 for LW, respectively, in order upward from the broadcasting station of the lowest frequency. Note that in mountainous or remote areas, broadcasting stations which have weak broadcasting signals cannot be automatically preset into the memory.

1 Power: "on" (⏻→⏻)

2 Press the "FM", "MW" or "LW" button.

3 Set to the minimum frequency.
- **FM: 87.50 MHz**
- **MW: 522 kHz**
- **LW: 155 kHz**



4 Press. When the frequency indication begins to change, release.

(The frequency will change upward, and the automatic presetting will begin with the broadcasting station of the lowest frequency and will continue in order.)

5 Confirm the names (call signs, etc.) of the broadcasting stations which are preset to each channel, and enter them on the file sheet.

Notes:

1. In areas where there are less than 8 FM stations, the remaining channels (through channel 8) will be left empty. The empty channels can be filled by using manual memory presetting.
2. If a new broadcasting station is preset into a channel, the broadcasting station which was previously entered in that channel will be automatically erased.

Manual memory presetting

Stations can be freely preset to any desired channel.

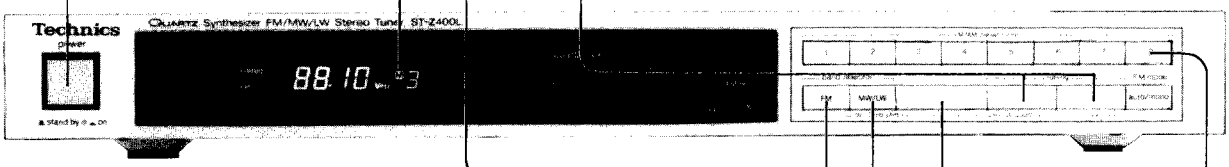
1 Power: "on" (▲ → ▬)

2 Press the "FM", "MW" or "LW" button.

3 Press the appropriate tuning button to tune to the desired broadcast.

- **Auto tuning**
  Press the button. When the frequency indication begins to change, release the button (a broadcasting station will be selected automatically). Repeat this operation until the desired station is found.

- **Manual tuning**
  Press the button momentarily and tune to the desired station (the frequency will change each time the button is pressed).



4 Press momentarily, and then release.
(The memory indicator will illuminate for approximately 4 seconds.)

Note:
If the button is pressed continuously, the frequency will begin to change, and the memory will be preset automatically.
To stop the automatic memory presetting, once again press either the "up" button or the "down" button.

5 While the memory indicator is illuminated, press the button of the desired channel.
When the button is pressed, the memory indicator illumination will stop, and the presetting is complete.

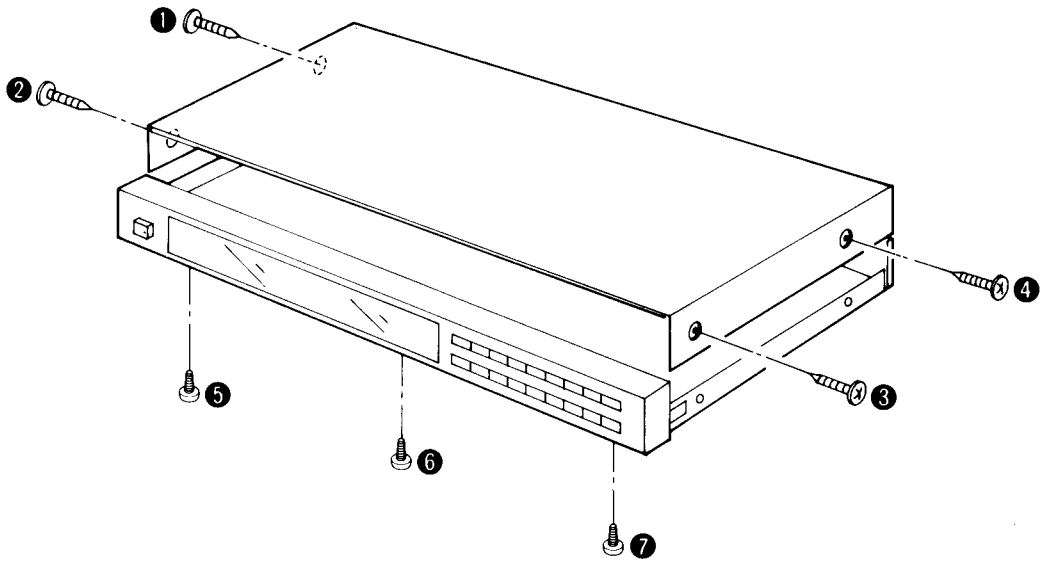
Note:
1. If the memory indication illumination stops before you press the button, once again repeat step (4) and then step (5).
2. If a new broadcasting station is preset into a channel, the broadcasting station which was previously entered in that channel will be automatically erased.

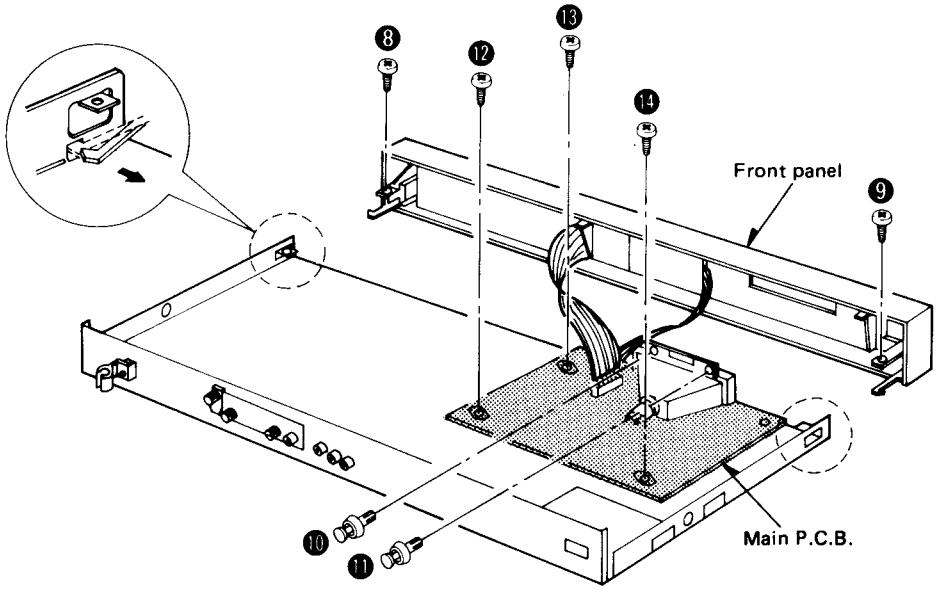
6 Enter the name (call sign, etc.) of the preset broadcasting station on the station memory file sheet.
This completes the procedures for presetting radio broadcast frequencies. The other preset-tuning buttons can be preset in the same way by following steps (2) through (5).

■ DISASSEMBLY INSTRUCTION

Ref. No.	How to remove the main P.C.B.
1	

(1) Remove the 4 screws (❶ ~ ❹).
(2) Remove the 5 screws (❺ ~ ❾) of front panel.
(3) Remove the 2 rivets (❿, ⓫) and the 3 screws (⓬ ~ ⓮) of main P.C.B.





■ BEFORE REPAIR

The power switch of this unit is located on the secondary side of the power transformer. Be sure to disconnect the power cord from the socket before servicing. Also, do the following before repair of digital circuits.

(1) Disconnect the power cord from the socket.
(2) Using a 10Ω, 1W resistor, short circuit electrolytic "gold" capacitors C902 and C903 momentarily to discharge them.

■ MEASUREMENTS AND ADJUSTMENTS

Note: AM OSC coil (L203), AM IFT (T201) and LW antenna coil (L251) have been already adjusted, and require no adjustment.

AM ADJUSTMENT

*** Setting and Equipment used**

1. AC and DC electronic voltmeters (EVM)
2. AM signal generator (AM-SG).
3. Set Band selector to "MW/LW" position.
4. Maintain line voltage at rated voltage.
5. Output of signal generator should be no higher than necessary to obtain an output reading.
6. Use a non-metal screwdriver for the adjustment.

Step No.	AM SIGNAL GENERATOR CONNECTION	AM SIGNAL GENERATOR FREQUENCY	DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	MW-RF ADJUSTMENT * Set band selector to "MW" position.					
1	Connect AM-SG to AM antenna terminal through 200 pF capacitor. Common to chassis. (Weak input)	612 kHz (30% Mod. with 400 Hz)	612 kHz	Connect AC EVM or scope to "OUTPUT" terminals.	L202 (ANT. Coil)	1. Adjust for maximum output. 2. Adjust core of L202 by screwdriver.
2		1503 kHz (30% Mod. with 400 Hz)	1503 kHz	Connect AC EVM or scope to "OUTPUT" terminals.	CT201 (ANT. Trimmer)	1. Adjust for maximum output. 2. Repeat steps (1) and (2) until the frequency correctly matches the frequency display.
	LW-RF ADJUSTMENT * Set band selector to "LW" position.					
3	Connect AM-SG to AM antenna terminal through 200 pF capacitor. Common to chassis. (Weak input)	155 kHz (30% Mod with 400 Hz)	155 kHz	Connect AC EVM or scope to "OUTPUT" terminals.	L252 (OSC. Coil)	1. Adjust for maximum output. 2. Adjust core of L252 by screwdriver.
4		353 kHz (30% Mod. with 400 Hz)	353 kHz	Connect AC EVM or scope to "OUTPUT" terminals	CT251 (ANT. Trimmer)	1. Adjust for maximum output. 2. Repeat steps (3) and (4) until the frequency correctly matches the frequency display.

FM ADJUSTMENT

*** Setting and Equipment used**

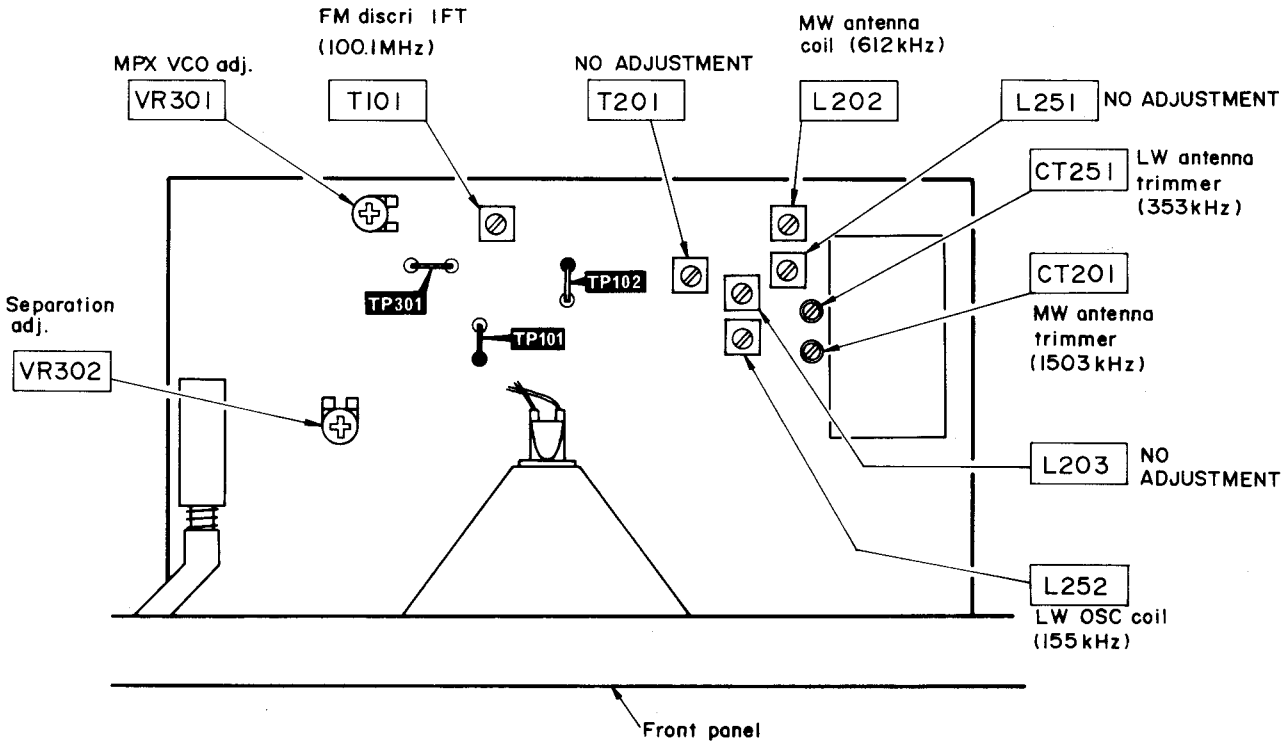
1. FM signal generator (FM-SG).
2. Stereo modulator.
3. Oscilloscope.
4. AC and DC electronic voltmeters (EVM).
5. Frequency counter (19 kHz and 108 MHz measurable).
6. Low-pass filter (fc : 15 kHz ~ 19 kHz).
7. Set Band selector to "FM" position.
8. Set FM mode switch to "mono" position.

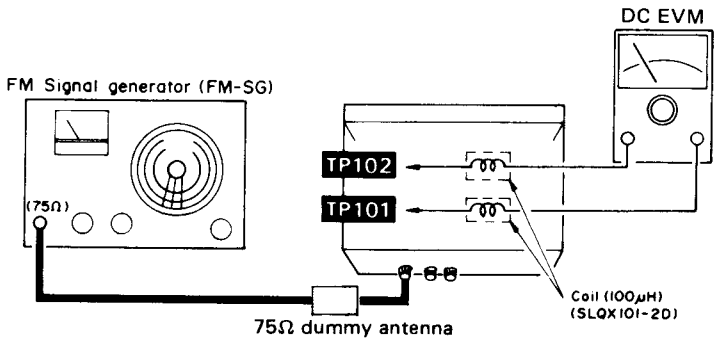
*** Preparation of FM signal generator (FM-SG)**

1. Apply SG output to antenna terminal of the set through 75Ω FM dummy antenna.
2. The standard input of the set is 60 dB (1 mV), 400 Hz, 100% modulation [Because of using dummy antenna, SG output must be 12 dB (4μV) plus (IHF). That is, when input 60 dB (1 mV), SG output is to be 72 dB (4 mV)].
3. Connect stereo modulator to FM-SG.

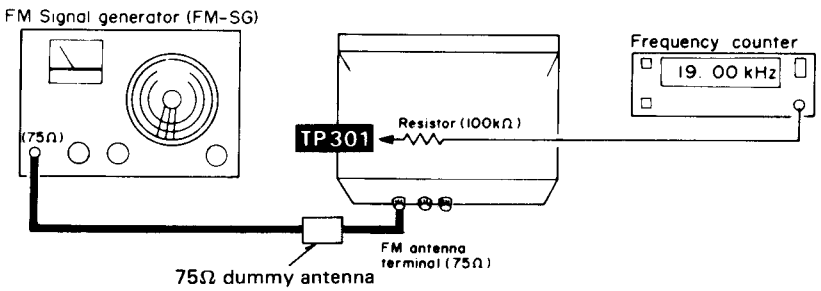
Step No.	FM SIGNAL GENERATOR CONNECTION	FM SIGNAL GENERATOR FREQUENCY	DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	FM-IF ADJUSTMENT					
5	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Apply 60 dB (1 mV) to antenna terminal)	100.1 MHz (90% Mod. with 400 Hz)	100.1 MHz	Connect DC EVM to between TP101 (−) and TP102 (+) through chock coil. (Refer to Fig. 1)	T101 (Discri. IFT)	Adjust T101 core so that voltage measured in signal mode is 0 mV in 300 mV range.
	FM MPX V.C.O. ADJUSTMENT					
	USING A FREQUENCY COUNTER			USING ALTERNATE SYSTEM		
6	1. 100.1 MHz, 60 dB Non-modulated mono signal applied to set. (Fig. 2) 2. FM mode switch to "auto" position. 3. Connect frequency counter to TP301 through resistor (100kΩ). 4. Adjust **VR301** to 19 kHz ± 30 Hz.			1. Apply stereo signal from generator or stereo station to tuner. 2. Adjust **VR301** until stereo indicator lights up. Cement arm of **VR301** as shown in Fig. 3.		
	SEPARATION ADJUSTMENT					
7	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1 MHz (100% Mod. with 1 kHz L or R mode)	100.1 MHz	Connect AC EVM to "OUTPUT" terminals of the set through low-pass filter. (fc = 15 kHz ~ 19 kHz)	VR302 (Separation)	1. Set the FM mode switch to "auto". 2. Adjust VR302 so that R output is minimized when stereo modulator is in L (L ch. modulation) mode and that L output is minimized in R mode.

- **Adjustment locations**

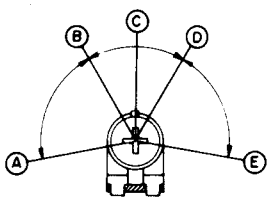




[Fig. 1] (Adjustment of FM offset)



[Fig. 2] (Adjustment of FM MPX VCO)



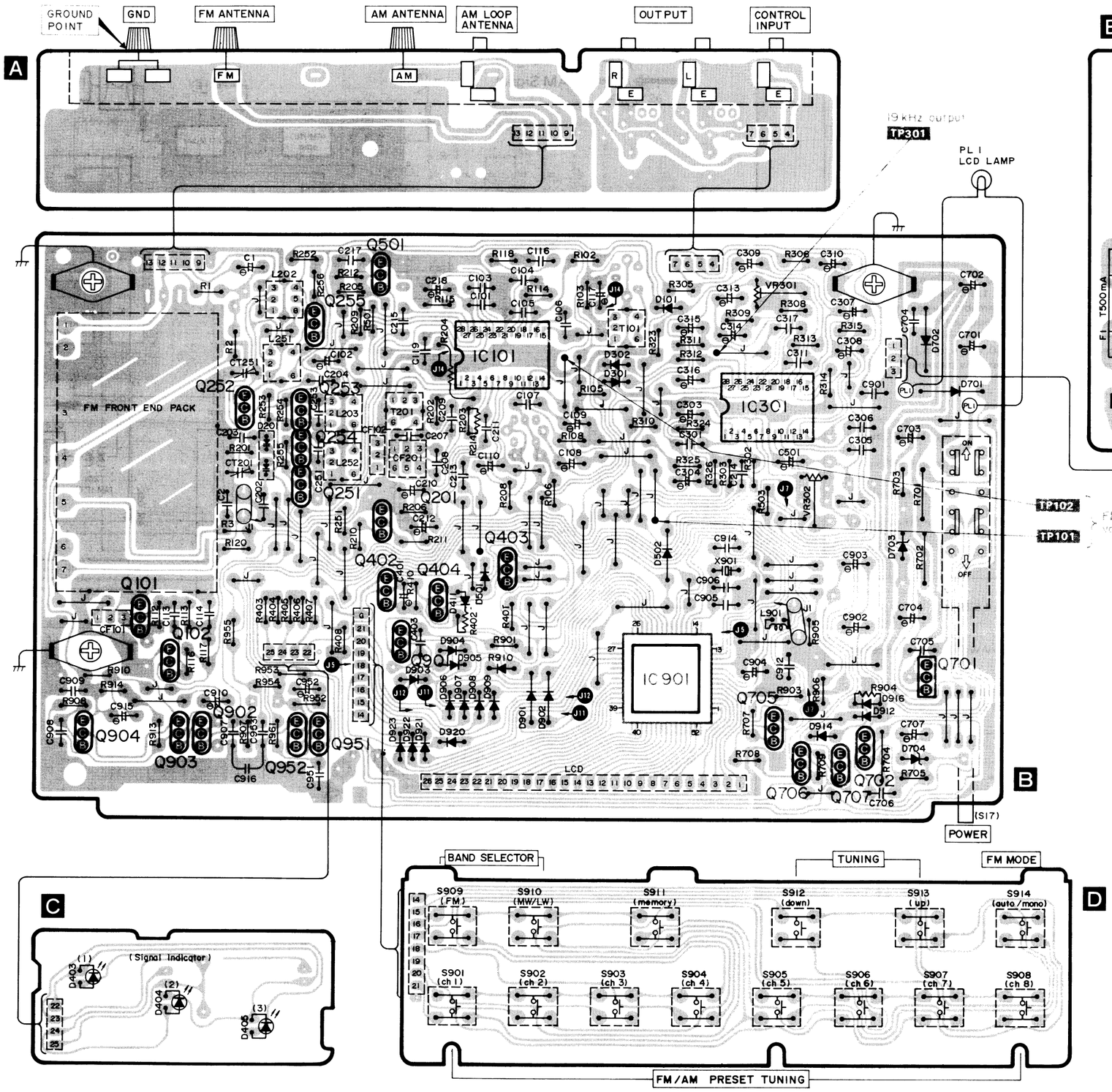
VR301 (10kΩ)

Ⓐ–Ⓑ,Ⓓ–Ⓔ : Stereo OFF position.
Ⓑ–Ⓓ : Stereo ON position.
(indicator lighting)
Ⓒ : Adjust point of pilot circuit

[Fig. 3] (Adjustment of FM MPX VCO)

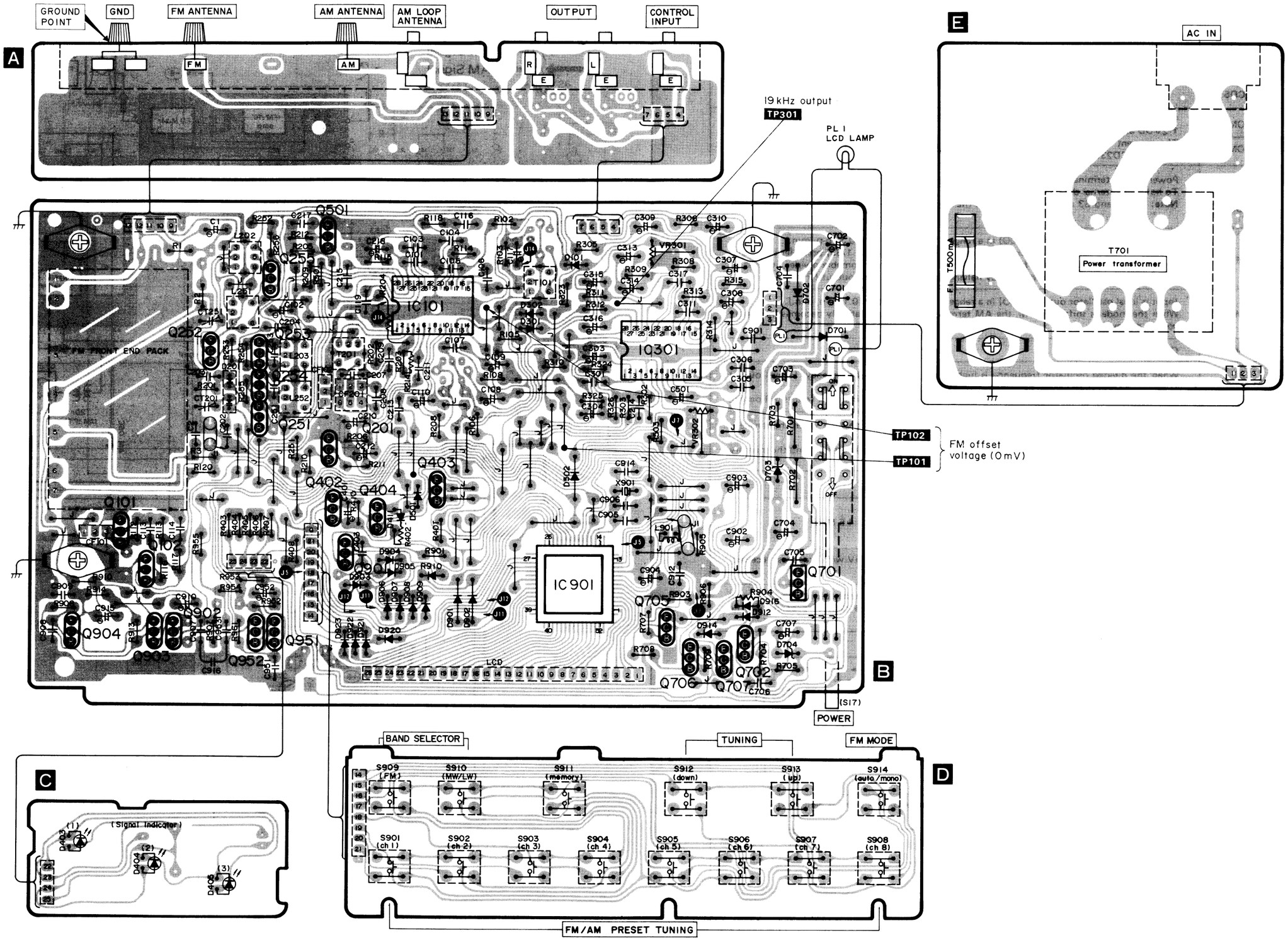
ST-Z400L

■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

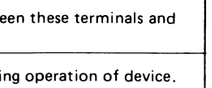
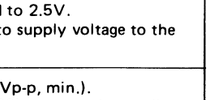
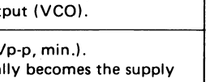


ST-Z400L

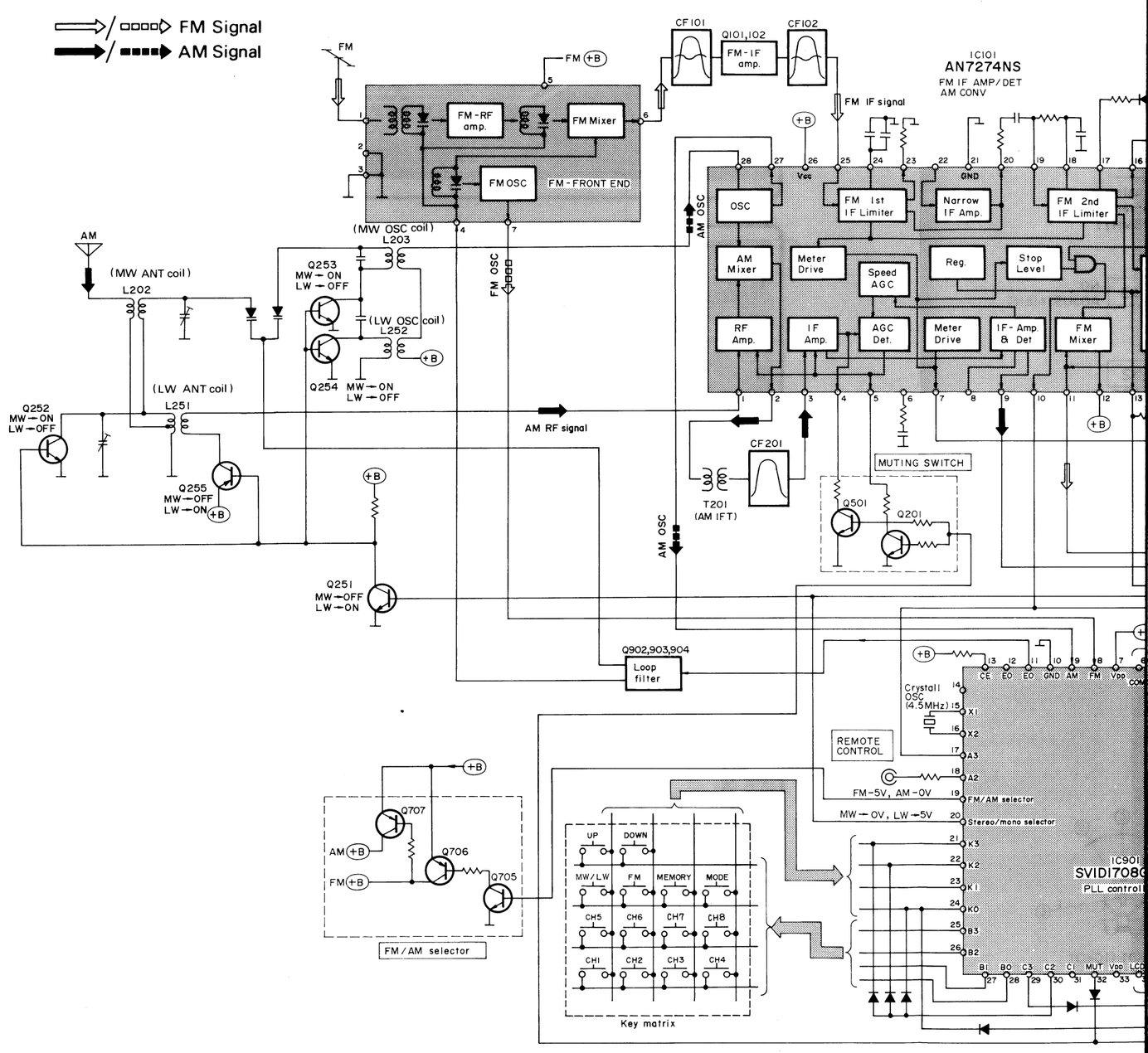
■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM



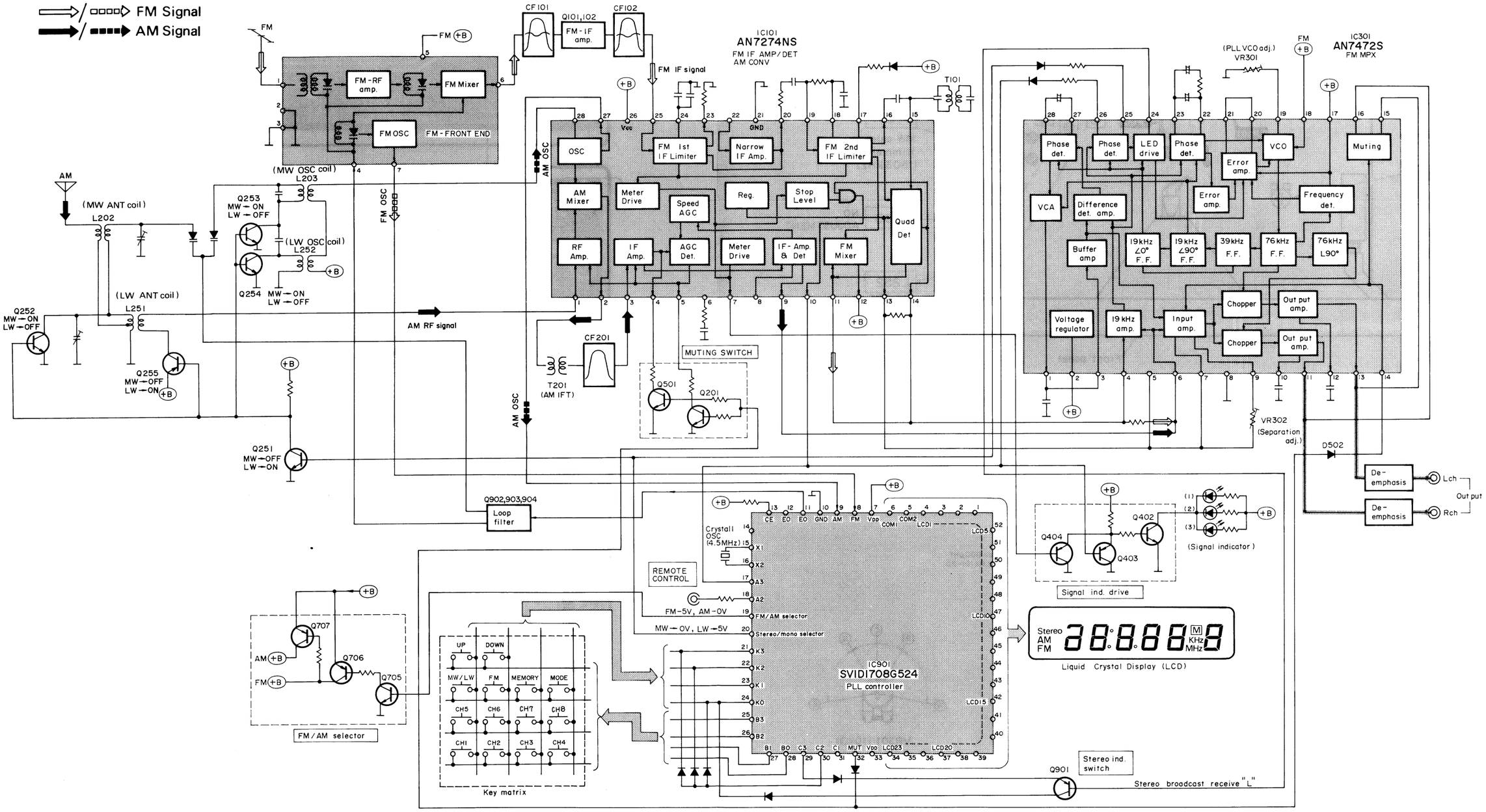
■ FUNCTION OF TERMINAL (PLL controller IC901)

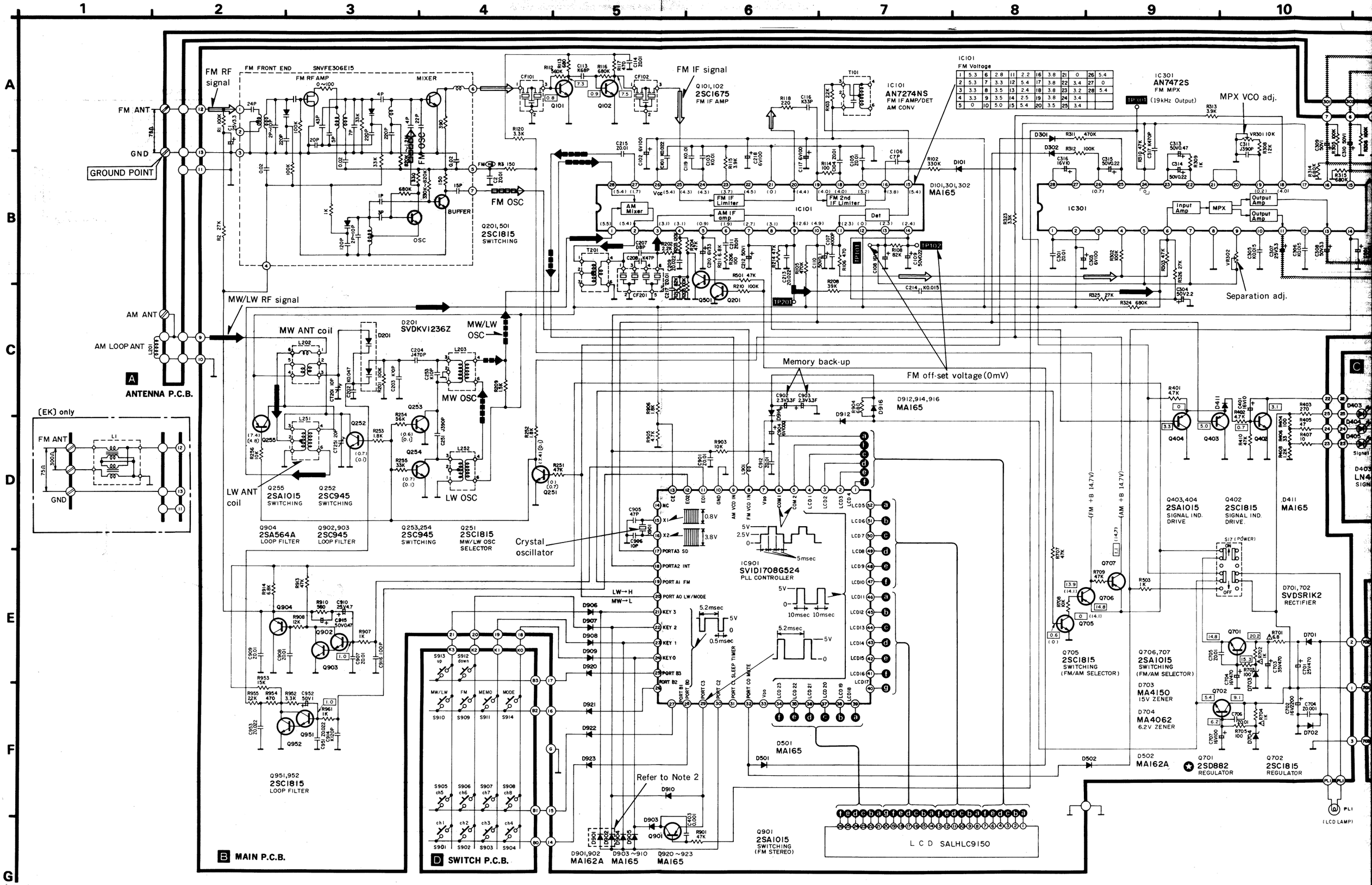
Pin No.	Mark	Description of terminal
1 ~ 4 34 ~ 52	LCD4 ~ LCD1 LCD23 ~ LCD5	Segment signal output terminal for display.
5	COM2	Common signal output terminal connected to LCD. Output is delivered in 3 values of ground, 1/2VDD and VDD (at 5ms intervals) in a period of 50 Hz. The segment turns ON when the difference in voltage is ± V_{DD} between these terminals and LCD1 ~ LCD23.
6	COM1	
7	VDD	Power supply terminal of device. Voltage of 5V ± 10% is supplied during operation of device. To hold the internal data memory (RAM), the voltage can be decreased to 2.5V. **Note:** Pins 7 and 33 are connected inside the chip. It is unnecessary to supply voltage to the pins.
33	VDD	
8	FM	Input is local oscillator output (VCO) in a range of 10 ~ 130 MHz (0.3Vp-p, min.). There are 1/2 fixed frequency division prescaler and 2-step (1/32, 1/33) prescaler internally. Therefore, when deciding the frequency dividing value of programmable divider, it must be decided from the frequency obtained by halving the local oscillator output (VCO).
9	AM	Input is local oscillator output (VCO) in a range of 0.5 ~ 20 MHz (0.1Vp-p, min.). When the mode is shifted to FM, the AM terminal voltage automatically becomes the supply voltage of device.
10	GND	Ground terminal.
11	E01	When the divided oscillator frequency is higher than the standard frequency, H-level output is delivered from these terminals. When it is lower, L-level (0V) output is delivered. When they coincide, it results in floating.
12	E02	
13	CE	Device selection signal input terminal. The signal level should be high when the device is operated, and low when not operated. With this terminal shifted to low level, LCD (liquid crystal display) turns off and the memory is held.
14	NC	Not used in this unit.
15	X1	Connecting terminal for crystal oscillator. The crystal connected is 4.5 MHz.
16	X2	
17	A3 (SD)	Terminal to put in stop signal during auto tuning. The voltage is 5V with broadcast received, and 0V without broadcast received.
18	A2 (INT)	This is the interrupt demand signal input terminal. The signal from the control input terminal is put into this terminal, demanding for interruption, then the flow of program will be unconditionally shifted to the address No. 1.
19	A1 (FM)	FM/AM output terminal. (FM → 5V, AM → 0V)
20	A0(LW/MODE)	Auto/mono and LW/MW changeover output terminal. (auto/MW → 0V, mono/LW → 5V)
21 ~ 24	K3 ~ K0	Input terminal for key return signal from external key matrix. 
25 ~ 28	B3 ~ B0	Output terminal for key return signal to external key matrix. 
29	C3	Terminal for FM IF ceramic filter frequency compensation. A pulse is generated when the voltage of terminal 13 rises.
30	C2	Output terminal for key return signal to let the stereo indicator light up. 
31	C1	Nut used in this unit.
32	C0	Muting signal output terminal. Muting signal is delivered during operation of FM/AM selector switch and tuning switch. (4V during muting)

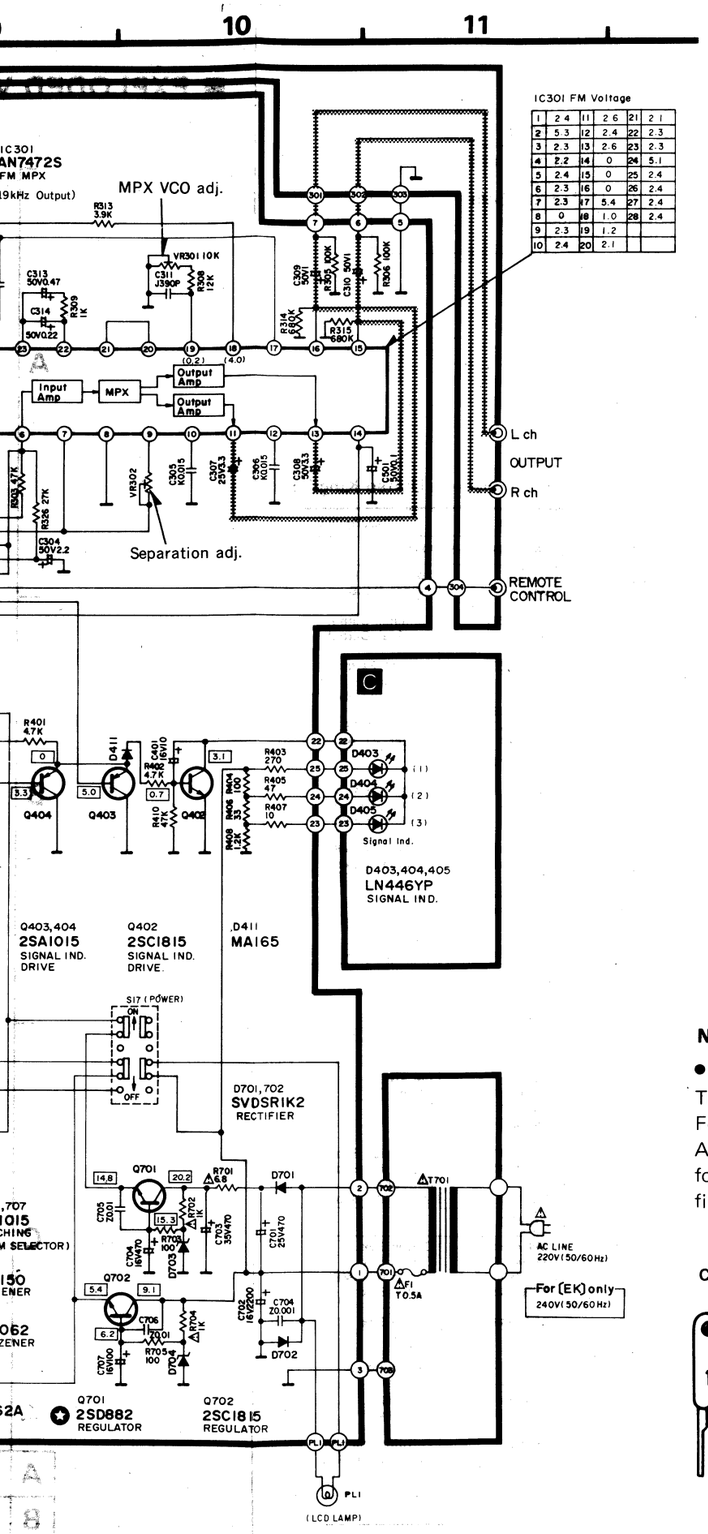
■ BLOCK DIAGRAM



■ BLOCK DIAGRAM




FM RF signal
FM FRONT END SNVFE306E15
FM RF AMP
MIXER
FM OSC
BUFFER
FM OSC
FM IF signal
Q101,102
2SC1675
FM IF AMP
IC101
AN7274NS
FM IF AMP/DET
AM CONV
IC101
FM Voltage
IC301
AN7472S
FM MPX
MPX VCO adj.
(19kHz Output)
Separation adj.
FM ANT
GND
GROUND POINT
FM IF Limiter
FM 2nd IF Limiter
AM Mixer
AM IF amp
Det
D101,301,302
MA165
Input Amp
MPX
Output Amp
Output Amp
MW/LW RF signal
AM ANT
AM LOOP ANT
ANTENNA P.C.B.
MW ANT coil
MW/LW OSC
MW OSC
LW ANT coil
LW OSC
Q255
2SA1015
SWITCHING
Q252
2SC945
SWITCHING
Q253,254
2SC945
SWITCHING
Q251
2SC1815
MW/LW OSC SELECTOR
Crystal oscillator
Memory back-up
FM off-set voltage(0mV)
D912,914,916
MA165
D501
MA165
D502
MA162A
Q403,404
2SA1015
SIGNAL IND. DRIVE
Q402
2SC1815
SIGNAL IND. DRIVE
D411
MA165
Q705
2SC1815
SWITCHING
(FM/AM SELECTOR)
Q706,707
2SA1015
SWITCHING
(FM/AM SELECTOR)
D703
MA4150
15V ZENER
D704
MA4062
6.2V ZENER
D701,702
SVDSRIK2
RECTIFIER
Q701
2SD882
REGULATOR
Q702
2SC1815
REGULATOR
IC901
SVIDI708G524
PLL CONTROLLER
Refer to Note 2
D901,902
MA162A
D903~910
MA165
D920~923
MA165
Q901
2SA1015
SWITCHING
(FM STEREO)
LCD SALHLC9150
(LCD LAMP)
(EK) only
Q904
2SA564A
LOOP FILTER
Q902,903
2SC945
LOOP FILTER
Q951,952
2SC1815
LOOP FILTER
B MAIN P.C.B.
D SWITCH P.C.B.



■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

* The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. with ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement part, please use the part No. in the replacement part list.
* This is the basic circuit diagram of this unit.
  Note that part of the circuit is subject to change depending on the areas.

Note 1:

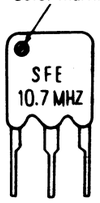
1. **S17** : Power source switch in "**on**" position.
2. **S901 ~ S908** : Preset tuning switch.
   * With it momentarily pushed (less than 0.4 sec.) and released, the 1 ~ 8 CH are received.
   * With it continuously pused (0.4 sec. or more) and released, the 9 ~ 16 CH are received.
3. **S909** : FM selector switch.
4. **S910** : MW/LW selector switch.
5. **S911** : Memory set switch. (manual ⟷ auto memory)
6. **S912** : Tuning (down) switch.
   [down: tuning to lower frequency]
7. **S913** : Tuning (up) switch.
   [up: tuning to higher frequency]
8. **S914** : FM mode switch. (stereo ⟷ mono)
9. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
   * Figures in □ stand for DC voltage in FM signal (no signal) reception mode.
   * Figures in ⌐ ⌙ stand for DC voltage in FM stereo signal reception mode.
   * Figures in ( ) stand for DC voltage in MW reception mode.
   * Figures in [ ] stand for DC voltage in LW signal reception mode.
10. ——— Positive voltage lines ▒▒▒ AF signal lines
    ⇨ FM signal ▭▭▭▷ FM IF ➡ AM signal ■■■■▶ AM IF
11. Important safety notice.
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified aprts.

Note 2:

• Use of ceramic filters in pairs

The ceramic filters (CF101, CF102) for FM-IF circuit are available in three ranks. For this machine, be usre to use the ceramics of the same rank in a pair.
At rapairing and replacement, pay close attention to the diodes (D901, D902) for use as different diodes must be used depending on each rank of the ceramic filters.

Color marking

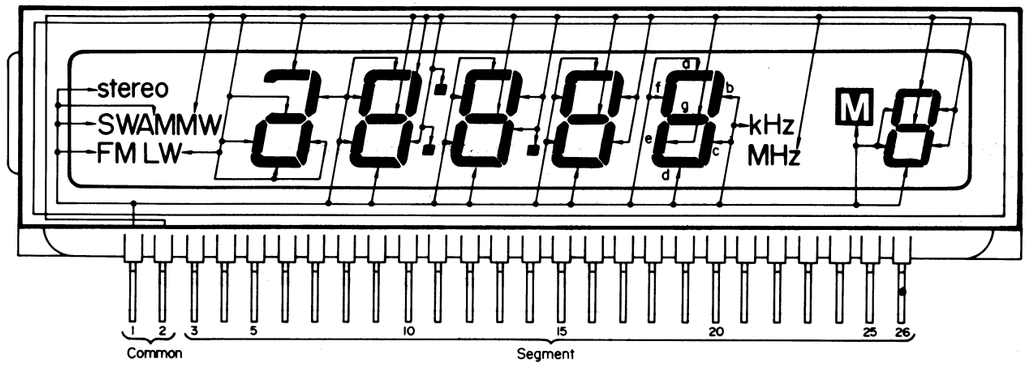


RANK (Color)	D901	D902	CENTER FREQUENCY
Black	O	X	10.65 MHz
Red	X	X	10.70 MHz
White	X	O	10.75 MHz

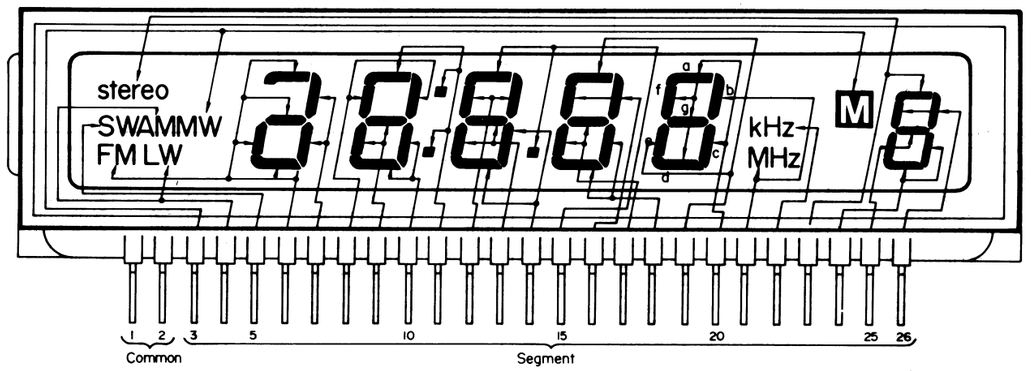
Note: O Mark : Diode is used.
X Mark : Diode is not used.

■ LIQUID CRISTAL DISPLAY (LCD)

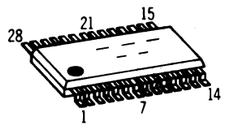
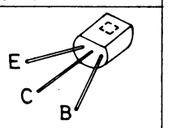
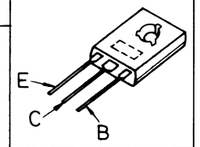
• Common terminal (No. 1, 2)

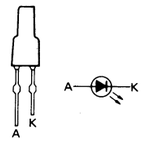
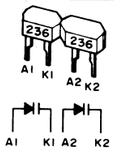
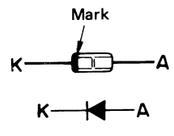
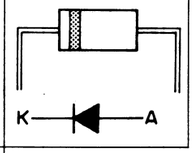


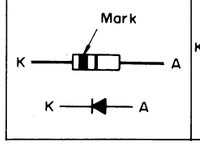
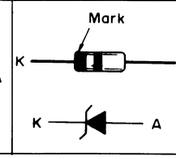
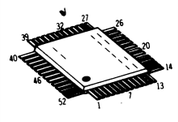
• Segment terminal (No. 3 ~ 26)



• Terminal guide of transistors, IC's and diodes

AN7274NS, AN7472S	2SA722 2SC945 2SA1015, 2SC1675 2SC1815	2SD882
		

LN446YP	SVDKV1236Z	MA165	SVDSR1K2
			

MA162A	MA4150M, MA4062M	SVID1708G524
		

■ RESISTORS AND CAPACITORS

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice. Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. The "Ⓢ" mark is service standard parts and may differ from production parts.
4. The unit of resistance is OHM (Ω). K = 1000Ω M = 1000kΩ
5. The unit of capacitance is MICROFARAD (μF) P = 10^{-6} μF

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	25 : 1/4W S2 : 1/4W	J : ±5%

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Capacitor Type	Voltage		Tolerance
	ECEA Type	Other	
ECEA : Electrolytic ECCD : Ceramic ECKD : Ceramic ECQM : Polyester ECQP : Polypropylene EECW : Liquid electrolyte double layer capacitor	0J : 6.3V 1A : 10V 1C : 16V 1E : 25V 1H : 50V 50 : 50V 25 : 25V	1H : 50V DC 2H : 500V DC 2R3 : 2.3V DC	C : ±0.25pF J : ±5% K : ±10% Z : +80%, −20%

Ref. No.	Part No.	Value
RESISTORS		
R1	ERDS2TJ104	100K
R2	ERDS2TJ273	27K
R3	ERDS2TJ151	150
R102	ERDS2TJ334	330K
R103	ERDS2TJ222	2.2K
R105	ERDS2TJ474	470K
R106	ERDS2TJ471	470
R108	ERDS2TJ823	82K
R112	ERDS2TJ564	560K
R113	ERDS2TJ681	680
R114	ERDS2TJ101	100
R115	ERDS2TJ392	3.9K
R116	ERDS2TJ684	680K
R117	ERDS2TJ471	470
R118	ERDS2TJ221	220
R120	ERDS2TJ332	3.3K
R201	ERDS2TJ104	100K
R202	ERDS2TJ222	2.2K
R203	ERDS2TJ124	120K
R204	ERDS2TJ473	47K
R205	ERDS2TJ104	100K
R206	ERDS2TJ101	100
R208	ERDS2TJ393	39K
R209	ERDS2TJ152	1.5K
R210	ERDS2TJ104	100K
R211	ERDS2TJ682	6.8K
R212	ERDS2TJ823	82K
R214, 251	ERDS2TJ473	47K
R252, 253	ERDS2TJ182	1.8K
R254	ERDS2TJ563	56K
R255	ERDS2TJ333	33K
R256	ERDS2TJ103	10K
R302	ERDS2TJ104	100K
R303	ERDS2TJ473	47K
R305, 306	ERDS2TJ104	100K
R308	ERDS2TJ123	12K
R309	ERDS2TJ102	1K
R310	ERDS2TJ473	47K
R311	ERDS2TJ474	470K
R312	ERDS2TJ104	100K

Ref. No.	Part No.	Value
RESISTORS		
R313	ERDS2TJ392	3.9K
R314, 315	ERDS2TJ684	680K
R323	ERDS2TJ332	3.3K
R324	ERDS2TJ684	680K
R325, 326	ERDS2TJ273	27K
R401, 402	ERDS2TJ472	4.7K
R403	ERDS2TJ271	270
R404	ERDS2TJ101	100
R405	ERDS2TJ470	47
R406	ERDS2TJ330	33
R407	ERDS2TJ100	10
R408	ERDS2TJ122	1.2K
R410	ERDS2TJ472	4.7K
R501	ERDS2TJ473	4.7K
R503	ERDS2TJ102	1K
R701 Ⓢ ⚠	ERD25FJ6R8	6.8
R702 Ⓢ ⚠	ERD25FJ102	1K
R703	ERDS2TJ101	100
R704 Ⓢ ⚠	ERD25FJ102	1K
R705	ERDS2TJ101	100
R707	ERDS2TJ473	47K
R708	ERDS2TJ103	10K
R709, 901	ERDS2TJ473	47K
R903	ERDS2TJ103	10K
R904	ERDS2TJ681	680
R905	ERDS2TJ472	4.7K
R906	ERDS2TJ182	1.8K
R907	ERDS2TJ102	1K
R908	ERDS2TJ123	12K
R910	ERDS2TJ561	560
R913	ERDS2TJ473	47K
R914	ERDS2TJ682	6.8K
R915 Ⓢ	ERD25FJ102	1K
R952	ERDS2TJ332	3.3K
R953	ERDS2TJ153	15K
R954	ERDS2TJ471	470
R955	ERDS2TJ222	2.2K
R961	ERDS2TJ102	1K

Ref. No.	Part No.	Value
CAPACITORS		
C1	ECEA1EU3R3	3.3
C2 Ⓢ	ECKD1H103ZF	0.01
C101	ECQM1H223JZ	0.022
C102	ECEA0JU101	100
C103	ECQM1H103JZ	0.01
C104, 105 Ⓢ	ECKD1H103ZF	0.01
C106 Ⓢ	ECCD1H070CC	7P
C107 Ⓢ	ECCD1H101K	100P
C108	ECEA1CU100	10
C109	ECEA1HUR22	0.22
C110	ECEA1HU0R1	0.1
C113 Ⓢ	ECCD1H680K	68P
C114 Ⓢ	ECKD1H103ZF	0.01
C116 Ⓢ	ECCD1H330K	33P
C117	ECEA0JU101	100
C119	ECQM1H103JZ	0.01
C202	ECQM1H473JZ	0.047
C203 Ⓢ	ECCD1H100KC	10P
C204	ECQP1471JZ	470P
C207 Ⓢ	ECCD1H080CC	8P
C208 Ⓢ	ECCD1H470K	47P
C209 Ⓢ	ECKD1H223ZF	0.022
C210	ECEA0JU330	33
C211 Ⓢ	ECKD1H103ZF	0.01
C212	ECEA1HU010	1
C213 Ⓢ	ECKD1H223ZF	0.022
C214	ECQM1H153JZ	0.015
C215, 217 Ⓢ	ECKD1H103ZF	0.01
C218	ECEA0JU101	100
C251	ECQP1391JZ	390P
C253	ECCD1H100KC	10P
C301 Ⓢ	ECKD1H103ZF	0.01
C303	ECEA0JU101	100

Ref. No.	Part No.	Value
CAPACITORS		
C304	ECEA1HU2R2	2.2
C305, 306	ECQM1H153JZ	0.015
C307, 308	ECEA1EU3R3	3.3
C309, 310	ECEA1HU010	1
C311	ECQP1391JZ	390P
C313	ECEA1HUR47	0.47
C314, 315	ECEA1HUR22	0.22
C316	ECEA1CU100	10
C317 Ⓢ	ECKD1H471KB	470P
C401	ECEA1CU100	10
C403 Ⓢ	ECKD1H102ZF	0.001
C501 Ⓢ	ECKD1HU0R1	0.1
C701	ECEA1EU471	470
C702	ECEA1CU222	2200
C703	ECEA1VU471	470
C704	ECEA1CU471	470
C705, 706 Ⓢ	ECKD1H103ZF	0.01
C707	ECEA1CU101	100
C708	ECKD1H102ZF	0.001
C901 Ⓢ	ECKD1H103ZF	0.01
C902, 903	EECW2R3A3R3	3.3F
C904	ECEA0JU102	1000
C905 Ⓢ	ECCD1H470K	47P
C906 Ⓢ	ECCD1H100KC	10P
C907, 908 Ⓢ	ECKD1H103ZF	0.01
C909 Ⓢ	ECKD1H103ZF	0.01
C910 Ⓢ	ECEA25M4R7R	4.2
C912 Ⓢ	ECKD1H103ZF	0.01
C914	ECCD1H121K	120P
C916 Ⓢ	ECCD1H101K	100P
C951 Ⓢ	ECKD1H223ZF	0.022
C952	ECEA1HU010	1
C953 Ⓢ	ECKD1H223ZF	0.022

■ REPLACEMENT PARTS LIST

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ - marked parts are used for black only, while ○ - marked parts are for silver type only.
4. Part other then Ⓚ - and ○ - marked are use for both black and silver type.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
6. The "Ⓢ" mark is service standard parts and may differ from production parts.
7. The parenthesized numbers in the column of descriptjon stand for the quantity per set.

Color	Area
(K)(S)	[EX]...Scandinavia and Switzerland.
(K)(S)	[EK]...United Kingdom
(S)	[EF]...France
(K)(S)	[EB]...Belgium

(MELUK . . . Made in United Kingdom)

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC101	AN7274NS	FM IF Amp. FM/AM Detector
IC301	AN7472S	FM MPX
IC901	SVID1708G524	Micro-Computer
TRANSISTORS		
Q101, 102 Ⓢ	2SC1675-L	FM IF Amp.
Q201, 251, 402, 501, 705, 951, 952	2SC1815-G	Switching, Signal Ind. Drive
Q255, 403, 404, Ⓢ 706, 707, 901	2SA1015-Y	Signal Ind. Drive, Switching
Q701	2SD793-Q	Regulator (Product Part No. is 2SD882-Q)
Q702	2SC1815-Y	Regulator
Q252 ~ 254, 902, Ⓢ 903	2SC945-Q	Loop Filter
Q904	2SA722-S	Loop Filter (Product Part No. is 2SA564A)
DIODES		
D101, 301, 302, 411, 501, 903 ~ 910, 912, 914, 920 ~ 923	MA165	Switching
D201	SVDKV1236Z	Variable Capacitance
D403 ~ 405	LN446YP	Signal Ind.
D502, 901, 902, Ⓢ 916	MA162A	Switching
D701, 702 ⚠	SVDSR1K2	Rectifier
D703	MA4150M	15V Zener
D704	MA4062M	6.2V Zener
COILS		
L1 [EK] only	SLAA4W1-3	Antenna
L202	SLA2B3-P	AM Antenna Coil
L203	SL02B9R-P	AM OSC Coil
L251	SLA1B7R-P	LW Antenna
L252	SL01B5-P	LW OSC
L901	RLQY25S5-0	Choke Coil
TRANSFORMERS		
T101	SLI4B515-Z	FM Discri IFT
T201	SLI2B104-M	AM IFT
T701 [EK] ⚠	SLT5K175	Power Transformer
T701 [other] ⚠	SLT5K171	Power Transformer
CERAMIC FILTERS		
CF101, 102	SVFE107MM-A	FM, 10.70MHz (Red)
	SVFE107MM-D	FM, 10.65MHz (Black)
	SVFE107MM-E	FM, 10.75MHz (White)
CF210	SVFSFZ450F7L	AM, 450kHz

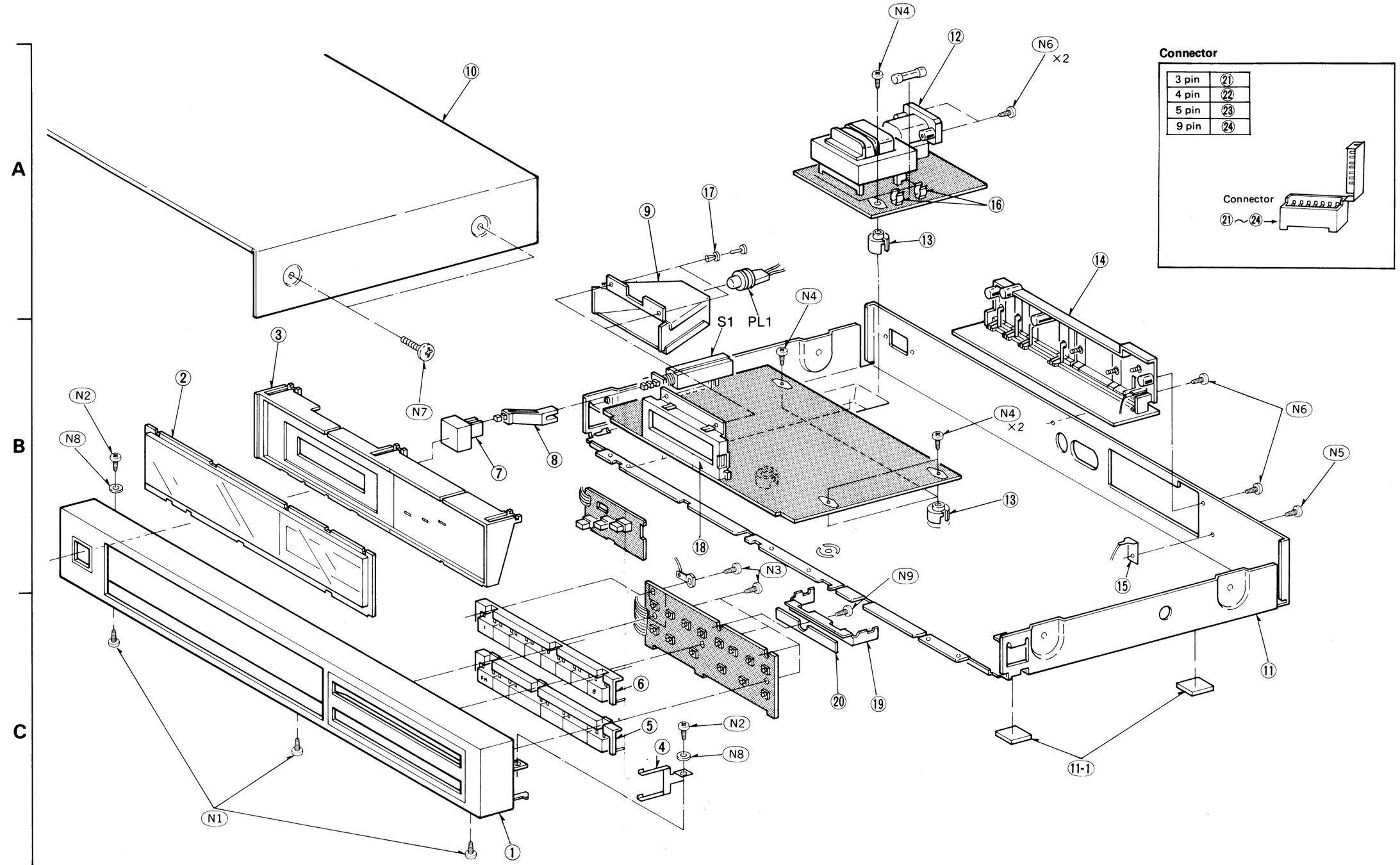
Ref. No.	Part No.	Description
CRYSTAL		
X901	SVQ49U452-T	4.5MHz
VARIABLE RESISTORS		
VR301	EVN75AA00B14	MPX VCO Adj. 10kΩ (B)
VR302	EVN58AA00B25	Separation Adj. 200kΩ (B)
VARIABLE CAPACITORS		
CT201	SVCTZ03110F	AM ANT Trimmer
CT251	SVCTZ03R200F	LW Trimmer
LAMP		
PL1 ⚠	XAMS15S150	LCD Lamp
FUSES		
F1 ⚠	XBA2C05TR0	250V, T500mA
SWITCHES		
S17 ⚠ S901 ~ 914	SSH1069 SSG13	Power Key-Board
LIQUID CRYSTAL DISPLAY		
LCD	SALHLC9150	Liquid Crystal Display
FM FRONT END		
	SNVFE306E15	FM Front End Pack

Ref. No.	Part No.	Description	
CABINET AND CHASSIS PARTS			
1 ○	SGW8200SB	Front Panel	(1)
1 Ⓚ	SGW8200BC	Front Panel	
2 ○	SGU414-2	Transparent Plate	(1)
2 Ⓚ	SGU414-4	Transparent Plate	(1)
3	SGXTZ400-SE	Sub Panel Ass'y	(1)
4	SUS759	Plate, Ground	(1)
5	SBC661B	Button, Selector	(1)
6	SBC660A	Button, Input Selector	(1)
7	SBC627	Button, Power	(1)
8	SUB201	Connection, Rod, Power	(1)
9	SMP376	Case, Lamp	(1)
10 ○	SKCTZ400-SE	Cabinet Ass'y	(1)
10 Ⓚ	SKCTZ400-KE	Cabinet Ass'y	(1)
11 [EX]	SGPTZ400L-SE	Chassis Ass'y (w/Feet)	(1)
11 [EK]	SGPTZ400L-SK	Chassis Ass'y (w/Feet)	(1)
11 [EB]	SGPTZ400L-SB	Chassis Ass'y (w/Feet)	(1)
11 [EF]	SGPTZ400L-SF	Chassis Ass'y (w/Feet) (MELUK)	(1)
11-1	SHS2481	Foot	(4)

Ref. No.	Part No.	Description	
CABINET AND CHASSIS PARTS			
12 ⚠	SJS9230	Socket, AC Inlet	(1)
13	SHE170	Holder, P.C.B.	(5)
14 [EK]	SJF8803N	Terminal, Output	(1)
14 [other]	SJF8709N	Terminal, Output	(1)
15	SUW1959	Bracket, Earth	(1)
16	SJT347	Clip, Fuse	(1)
17	SHR415	Pin, Lamp Case	(2)
18	SHR9732	Holder, LCD	(1)
19	SUW2873	Bracket, P.C.B.	(1)
20	SMX854	Spacer, P.C.B.	(1)
SCREWS AND WASHERS			
N1 Ⓢ	XTB3 + 8BFZ	Tapping, ⊕3×8	(3)
N2 Ⓢ	XTB3 + 8BFN	Tapping, ⊕3×8	(2)
N3 Ⓢ	XTB3 + 8BFN	Tapping, ⊕3×8	(6)
N4 Ⓢ	XTB3 + 12BFN	Tapping, ⊕3×12	(4)
N5 Ⓢ	XTB3 + 8BFZ	Tapping, ⊕3×8	(1)
N6 Ⓢ	XTB3 + 8BFZ	Tapping, ⊕3×8	(4)
N7 ○	SNE2095-4	Cabinet	(4)
N7 Ⓚ	SNE2095-5	Cabinet	(4)
N8 Ⓢ	XWG3	Washer, φ3	(2)
N9 Ⓢ	XTN3 + 10BFZ	Tapping, ⊕3×10	(1)
ACCESSORIES			
A1 [EK] ⚠	SFDAC05G02	AC Cord	(1)
A1 [other] ⚠	SJA171	AC Cord	(1)
A2	SJP2129-5	Pin Cord	(1)
A3	SSA267-1	**FM ANT**	(1)
A4	SSA611-1	**AM ANT**	(1)
A5	SMA231	Holder	(1)
A6	SMA233-1	Holder	(1)
A7 [EK]	SQF12073	Instruction Book [MELUK]	(1)
A7 [EF]	SQF12074	Instruction Book	(1)
A7 [other]	SQF12069	Instruction Book	(1)
PACKING PARTS			
P1 [EK] ○	SPG4944	Carton Box	(1)
P1 [EK] Ⓚ	SPG4947	Carton Box	(1)
P1 [EF] ○	SPG4936	Carton Box [MELUK]	(1)
P1 ○ [EX, EB]	SPG4943	Carton Box	(1)
P1 Ⓚ [EX, EB]	SPG4946	Carton Box	(1)
P2	SPS4470	Pad, Bottom	(1)
P3	SPS4456	Pad, Left	(1)
P4	SPS4457	Pad, Right	(1)
P5	SPS4458	Pad, Upper	(1)
P6 ○	SPP697	Polyethylene Bag	(1)
P6 Ⓚ	SPP734	Polyethylene Bag	(1)

■ EXPLODED

■ EXPLODED VIEW



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